



	Experiment title: Temperatur Dependend Phonon Density of States of the Invar Alloy $\text{Fe}_{72}\text{Pt}_{28}$	Experiment number: HS-585
Beamline: ID 18	Date of Experiment: from: 19. Feb. 1998 to: 26. Feb. 1998	Date of Report: 31. Aug. 1998
Shifts: 9	Local contact(s): A. I. Chumakov	Received at ESRF: 01 SEP. 1998

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Report:

Accepted as report of the PHONONS 98 conference in Lancaseter, UK, which will be published in Physika B.

Abstract:

Inelastic nuclear resonant absorption of synchrotron radiation was applied to determine the phonon density of states of the invar alloy $\text{Fe}_{72}\text{Pt}_{28}$. Using a double crystal monochromator with asymmetric Si (975) reflections we arrived at an energy resolution of 0.8 meV. Anharmonic behaviour was observed in the energy regime of the $\text{TA}_{[110]}$ phonon branch and the highest energy optical branch. The data may be used to determine the lattice thermal expansion, the vibrational entropy and the vibrational contribution to the capacity of heat.